

SAF-RC-189
100N Field Remediation –
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt H4-21

COMMENTS:

SDG JP0785 SAF-RC-189

Sample Location: 100-N-99

Date: 27 May 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-99
Subject: PAH - Data Package No. JP0785-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0785 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

| Sample ID | Sample Date | Media | Validation | Analyte |
|------------------|--------------------|--------------|-------------------|----------------|
| J1TL55 | 5/1/14 | Soil | C | See note 1 |
| J1TL56 | 5/1/14 | Soil | C | See note 1 |
| J1TL57 | 5/1/14 | Soil | C | See note 1 |
| J1TL58 | 5/1/14 | Soil | C | See note 1 |
| J1TL59 | 5/1/14 | Soil | C | See note 1 |
| J1TL60 | 5/1/14 | Soil | C | See note 1 |
| J1TL61 | 5/1/14 | Soil | C | See note 1 |
| J1TL62 | 5/1/14 | Soil | C | See note 1 |
| J1TL63 | 5/1/14 | Soil | C | See note 1 |
| J1TL64 | 5/1/14 | Soil | C | See note 1 |

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

One field blank (J1TL64) was submitted for analysis. No analytes were detected in the field blank.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to RPDs outside QC limits, all (except JTL63) PAH results (except benzo(a)pyrene) were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1TL60/J1TL63) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. JP0785 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to RPDs outside QC limits, all (except JTL63) PAH results (except benzo(a)pyrene) were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-2005-92, Rev. 0, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

INORGANICS DATA QUALIFICATION SUMMARY*

| | | | |
|-----------------------------|------------------|----------------------|---------------------------|
| SDG: JP0785 | REVIEWER: ELR | Project: 100-N-99 | PAGE <u>1</u> OF <u>1</u> |
| COMPOUND | QUALIFIER | SAMPLES AFFECTED | REASON |
| All (except benzo(a)pyrene) | J | All (except J1TL63) | RPD |

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1
Sdg Number: JP0785

Client Sample ID: J1TL55

Lab Sample ID: 280-54971-1

Client Matrix: Solid

% Moisture: 0.7

Date Sampled: 05/01/2014 0833

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Prep Method: 3550C

Dilution: 1.0

Analysis Date: 05/07/2014 1748

Prep Date: 05/02/2014 1755

Analysis Batch: 280-224587

Prep Batch: 280-224050

Instrument ID:

CHHPLC_G

Initial Weight/Volume:

30.3 g

Final Weight/Volume:

4 mL

Injection Volume:

20 uL

Result Type:

PRIMARY

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|-----|
| Acenaphthene | | 10 | UN | 10 | 100 |
| Acenaphthylene | | 9.0 | UN | 9.0 | 100 |
| Anthracene | | 3.0 | UN | 3.0 | 20 |
| Benzo[a]anthracene | | 3.2 | UN | 3.2 | 15 |
| Benzo[a]pyrene | | 6.4 | UN | 6.4 | 15 |
| Benzo[b]fluoranthene | | 4.2 | UN | 4.2 | 15 |
| Benzo[g,h,i]perylene | | 7.2 | UN | 7.2 | 30 |
| Benzo[k]fluoranthene | | 3.9 | UN | 3.9 | 15 |
| Chrysene | | 4.8 | UN | 4.8 | 40 |
| Dibenzo[a,h]anthracene | | 11 | UN | 11 | 30 |
| Fluoranthene | | 13 | UN | 13 | 40 |
| Fluorene | | 5.3 | UN | 5.3 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | UN | 12 | 30 |
| Naphthalene | | 12 | UN | 12 | 100 |
| Phenanthrene | | 12 | UN | 12 | 40 |
| Pyrene | | 12 | UN | 12 | 40 |

Surrogate

%Rec

Qualifier

Acceptance Limits

Terphenyl-d14 (SUR)

81

72 - 115

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL56

Lab Sample ID: 280-54971-2

Date Sampled: 05/01/2014 0835

Client Matrix: Solid

% Moisture: 1.6

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 30.0 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 1920

Injection Volume: 20 uL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

✓ 6/8/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-------------------|-----|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.1 | U | 9.1 | 100 |
| Anthracene | | 3.1 | U | 3.1 | 20 |
| Benzo[a]anthracene | | 3.2 | U | 3.2 | 15 |
| Benzo[a]pyrene | | 6.5 | U | 6.5 | 15 |
| Benzo[b]fluoranthene | | 4.3 | U | 4.3 | 15 |
| Benzo[g,h,i]perylene | | 7.3 | U | 7.3 | 30 |
| Benzo[k]fluoranthene | | 4.0 | U | 4.0 | 15 |
| Chrysene | | 4.9 | U | 4.9 | 41 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 13 | U | 13 | 41 |
| Fluorene | | 5.4 | U | 5.4 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 41 |
| Pyrene | | 12 | U | 12 | 41 |
| Surrogate | | %Rec | Qualifier | Acceptance Limits | |
| Terphenyl-d14 (SUR) | | 81 | | 72 - 115 | |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL57

Lab Sample ID: 280-54971-3

Date Sampled: 05/01/2014 0838

Client Matrix: Solid

% Moisture: 3.2

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 31.6 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 1950

Injection Volume: 20 uL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

15/8/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|----|
| Acenaphthene | | 9.8 | U J | 9.8 | 98 |
| Acenaphthylene | | 8.8 | U J | 8.8 | 98 |
| Anthracene | | 3.0 | U J | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U J | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U J | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.1 | U | 7.1 | 29 |
| Benzo[k]fluoranthene | | 3.9 | U | 3.9 | 15 |
| Chrysene | | 4.7 | U | 4.7 | 39 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 29 |
| Fluoranthene | | 13 | U | 13 | 39 |
| Fluorene | | 5.2 | U | 5.2 | 29 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 29 |
| Naphthalene | | 12 | U | 12 | 98 |
| Phenanthrene | | 12 | U | 12 | 39 |
| Pyrene | | 12 | U | 12 | 39 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---------------------|------|-----------|-------------------|
| Terphenyl-d14 (SUR) | 76 | | 72 - 115 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL58

Lab Sample ID: 280-54971-4

Date Sampled: 05/01/2014 0840

Client Matrix: Solid

% Moisture: 1.2

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 31.1 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 2021

Injection Volume: 20 µL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

Handwritten: 5/6/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|------------|-------------------|----|
| Acenaphthene | | 9.8 | U <i>J</i> | 9.8 | 98 |
| Acenaphthylene | | 8.8 | U <i>J</i> | 8.8 | 98 |
| Anthracene | | 3.0 | U <i>J</i> | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U <i>J</i> | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U <i>J</i> | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.0 | U | 7.0 | 29 |
| Benzo[k]fluoranthene | | 3.8 | U | 3.8 | 15 |
| Chrysene | | 4.7 | U | 4.7 | 39 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 29 |
| Fluoranthene | | 13 | U | 13 | 39 |
| Fluorene | | 5.2 | U | 5.2 | 29 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 29 |
| Naphthalene | | 12 | U | 12 | 98 |
| Phenanthrene | | 12 | U | 12 | 39 |
| Pyrene | | 12 | U <i>↓</i> | 12 | 39 |
| Surrogate | | %Rec | Qualifier | Acceptance Limits | |
| Terphenyl-d14 (SUR) | | 77 | | 72 - 115 | |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL59

Lab Sample ID: 280-54971-5

Date Sampled: 05/01/2014 0830

Client Matrix: Solid

% Moisture: 1.0

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 30.7 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 2052

Injection Volume: 20 µL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

✓ u/s/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|----|
| Acenaphthene | | 9.9 | U | 9.9 | 99 |
| Acenaphthylene | | 8.9 | U | 8.9 | 99 |
| Anthracene | | 3.0 | U | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.1 | U | 7.1 | 30 |
| Benzo[k]fluoranthene | | 3.9 | U | 3.9 | 15 |
| Chrysene | | 4.8 | U | 4.8 | 39 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 13 | U | 13 | 39 |
| Fluorene | | 5.2 | U | 5.2 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 99 |
| Phenanthrene | | 12 | U | 12 | 39 |
| Pyrene | | 12 | U | 12 | 39 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---------------------|------|-----------|-------------------|
| Terphenyl-d14 (SUR) | 80 | | 72 - 115 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL60

Lab Sample ID: 280-54971-6

Date Sampled: 05/01/2014 0822

Client Matrix: Solid

% Moisture: 1.0

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 31.0 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 2153

Injection Volume: 20 uL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|----|
| Acenaphthene | | 9.8 | U J | 9.8 | 98 |
| Acenaphthylene | | 8.8 | U J | 8.8 | 98 |
| Anthracene | | 3.0 | U J | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U J | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U J | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.0 | U | 7.0 | 29 |
| Benzo[k]fluoranthene | | 3.9 | U | 3.9 | 15 |
| Chrysene | | 4.7 | U | 4.7 | 39 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 29 |
| Fluoranthene | | 13 | U | 13 | 39 |
| Fluorene | | 5.2 | U | 5.2 | 29 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 29 |
| Naphthalene | | 12 | U | 12 | 98 |
| Phenanthrene | | 12 | U | 12 | 39 |
| Pyrene | | 12 | U | 12 | 39 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---------------------|------|-----------|-------------------|
| Terphenyl-d14 (SUR) | 81 | | 72 - 115 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL61

Lab Sample ID: 280-54971-7

Date Sampled: 05/01/2014 0826

Client Matrix: Solid

% Moisture: 1.0

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 30.8 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 2223

Injection Volume: 20 uL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

W 6/8/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|----|
| Acenaphthene | | 9.8 | U J | 9.8 | 98 |
| Acenaphthylene | | 8.9 | U J | 8.9 | 98 |
| Anthracene | | 3.0 | U J | 3.0 | 20 |
| Benzo[a]anthracene | | 3.1 | U J | 3.1 | 15 |
| Benzo[a]pyrene | | 6.3 | U J | 6.3 | 15 |
| Benzo[b]fluoranthene | | 4.1 | U J | 4.1 | 15 |
| Benzo[g,h,i]perylene | | 7.1 | U J | 7.1 | 30 |
| Benzo[k]fluoranthene | | 3.9 | U J | 3.9 | 15 |
| Chrysene | | 4.8 | U J | 4.8 | 39 |
| Dibenzo[a,h]anthracene | | 11 | U J | 11 | 30 |
| Fluoranthene | | 13 | U J | 13 | 39 |
| Fluorene | | 5.2 | U J | 5.2 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U J | 12 | 30 |
| Naphthalene | | 12 | U J | 12 | 98 |
| Phenanthrene | | 12 | U J | 12 | 39 |
| Pyrene | | 12 | U J | 12 | 39 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---------------------|------|-----------|-------------------|
| Terphenyl-d14 (SUR) | 80 | | 72 - 115 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL62

Lab Sample ID: 280-54971-8

Date Sampled: 05/01/2014 0828

Client Matrix: Solid

% Moisture: 1.1

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 30.2 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 2254

Injection Volume: 20 uL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|-----|
| Acenaphthene | | 10 | U J | 10 | 100 |
| Acenaphthylene | | 9.0 | U J | 9.0 | 100 |
| Anthracene | | 3.1 | U J | 3.1 | 20 |
| Benzo[a]anthracene | | 3.2 | U J | 3.2 | 15 |
| Benzo[a]pyrene | | 6.4 | U | 6.4 | 15 |
| Benzo[b]fluoranthene | | 4.2 | U J | 4.2 | 15 |
| Benzo[g,h,i]perylene | | 7.2 | U | 7.2 | 30 |
| Benzo[k]fluoranthene | | 4.0 | U | 4.0 | 15 |
| Chrysene | | 4.9 | U | 4.9 | 40 |
| Dibenzo(a,h)anthracene | | 11 | U | 11 | 30 |
| Fluoranthene | | 13 | U | 13 | 40 |
| Fluorene | | 5.3 | U | 5.3 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 40 |
| Pyrene | | 12 | U | 12 | 40 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---------------------|------|-----------|-------------------|
| Terphenyl-d14 (SUR) | 80 | | 72 - 115 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL63

Lab Sample ID: 280-54971-9

Date Sampled: 05/01/2014 0822

Client Matrix: Solid

% Moisture: 0.9

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-225681

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-225338

Initial Weight/Volume: 30.2 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/14/2014 1211

Injection Volume: 20 uL

Prep Date: 05/12/2014 1434

Result Type: PRIMARY

Handwritten: 6/8/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|-----|
| Acenaphthene | | 10 | U | 10 | 100 |
| Acenaphthylene | | 9.0 | U | 9.0 | 100 |
| Anthracene | | 3.1 | U N | 3.1 | 20 |
| Benzo[a]anthracene | | 3.2 | U | 3.2 | 15 |
| Benzo[a]pyrene | | 6.4 | U | 6.4 | 15 |
| Benzo[b]fluoranthene | | 4.2 | U N | 4.2 | 15 |
| Benzo[g,h,i]perylene | | 7.2 | U | 7.2 | 30 |
| Benzo[k]fluoranthene | | 4.0 | U N | 4.0 | 15 |
| Chrysene | | 4.9 | U | 4.9 | 40 |
| Dibenzo(a,h)anthracene | | 11 | U N | 11 | 30 |
| Fluoranthene | | 13 | U N | 13 | 40 |
| Fluorene | | 5.3 | U | 5.3 | 30 |
| Indeno[1,2,3-cd]pyrene | | 12 | U N | 12 | 30 |
| Naphthalene | | 12 | U | 12 | 100 |
| Phenanthrene | | 12 | U | 12 | 40 |
| Pyrene | | 12 | U | 12 | 40 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|---------------------|------|-----------|-------------------|
| Terphenyl-d14 (SUR) | 79 | | 72 - 115 |

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL64

Lab Sample ID: 280-54971-10

Date Sampled: 05/01/2014 0820

Client Matrix: Solid

% Moisture: 0.0

Date Received: 05/02/2014 0940

8310 PAHs (HPLC)

Analysis Method: 8310

Analysis Batch: 280-224587

Instrument ID: CHHPLC_G

Prep Method: 3550C

Prep Batch: 280-224050

Initial Weight/Volume: 32.7 g

Dilution: 1.0

Final Weight/Volume: 4 mL

Analysis Date: 05/07/2014 2355

Injection Volume: 20 uL

Prep Date: 05/02/2014 1755

Result Type: PRIMARY

Handwritten: 6/8/14

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|------------------------|--------------------|----------------|-----------|-----|----|
| Acenaphthene | | 9.2 | U | 9.2 | 92 |
| Acenaphthylene | | 8.3 | U | 8.3 | 92 |
| Anthracene | | 2.8 | U | 2.8 | 18 |
| Benzo[a]anthracene | | 2.9 | U | 2.9 | 14 |
| Benzo[a]pyrene | | 5.9 | U | 5.9 | 14 |
| Benzo[b]fluoranthene | | 3.9 | U | 3.9 | 14 |
| Benzo[g,h,i]perylene | | 6.6 | U | 6.6 | 28 |
| Benzo[k]fluoranthene | | 3.6 | U | 3.6 | 14 |
| Chrysene | | 4.4 | U | 4.4 | 37 |
| Dibenzo(a,h)anthracene | | 10 | U | 10 | 28 |
| Fluoranthene | | 12 | U | 12 | 37 |
| Fluorene | | 4.8 | U | 4.8 | 28 |
| Indeno[1,2,3-cd]pyrene | | 11 | U | 11 | 28 |
| Naphthalene | | 11 | U | 11 | 92 |
| Phenanthrene | | 11 | U | 11 | 37 |
| Pyrene | | 11 | U | 11 | 37 |

Surrogate

%Rec

Qualifier

Acceptance Limits

Terphenyl-d14 (SUR)

81

72 - 115

Appendix 4
Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-54971-1

SDG #: JP0785

SAF#: RC-189

Date SDG Closed: May 2, 2014

Data Deliverable: 7 Day / Summary

| <u>CLIENT ID</u> | <u>LAB ID</u> | <u>ANALYSES REQUESTED</u> | <u>ANALYSES PERFORMED</u> |
|------------------|---------------|---------------------------|---------------------------|
| J1TL55 | 280-54971-1 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL56 | 280-54971-2 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL57 | 280-54971-3 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL58 | 280-54971-4 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL59 | 280-54971-5 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL60 | 280-54971-6 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL61 | 280-54971-7 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL62 | 280-54971-8 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL63 | 280-54971-9 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL64 | 280-54971-10 | 8310 | 8310 |

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 5/2/2014 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.4° C.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.

HPLC - SW846 8310 - PAHs

The LCS, MS and MSD associated with sample J1TL63 in batch 280-225338 exhibited percent recoveries outside the control limits, biased low, for Benzo(b)fluoranthene. It can be noted that this was the third extraction/analysis of sample J1TL63. Two previous extractions/analyses performed on sample J1TL63 showed no detectable concentrations, but exhibited surrogate recovery or multiple LCS outliers. As the sample has been confirmed to be Non-Detect, a fourth extraction/analysis was not initiated. The client was notified on 5/15/2014.

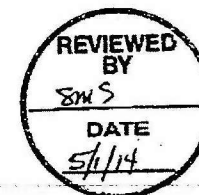
The MS aliquot of the MS/MSD performed on sample J1TL55 in batch 280-224050 exhibited all spike compound recoveries and the surrogate recovery outside the control limits, biased low. The associated sample results have been flagged "N". As a result of the low MS recoveries, the MS/MSD RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1TL63 in batch 280-225338 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.


No other anomalies were encountered.

| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-188-286 | | Page 1 of 2 | |
|---|--|--|--|--|--------------------|----------------------|--|-----------------|--|
| Collector Q. STOWE | Company Contact Joan Kessner | Telephone No. 375-4688 | | Project Coordinator KESSNER, JH | | Price Code | | Data Turnaround | |
| Project Designation 100N Field Remediation | Sampling Location 100-N-99 Verification | | SAF No. RC-189 | | 7 day | | | | |
| Ice Chest No. WCH-11-009 | Field Logbook No. EL-1652-11 | COA 000N992000 | | Method of Shipment Commercial Carrier 1 Fed Ex | | | | | |
| Shipped To TestAmerica Denver | Offsite Property No. A131135 | | Bill of Lading/Air Bill No. See O.S.P. | | | | | | |
| Other Labs Shipped To MIA | | Preservation | Cool 4C | Cool 4C | | | | | |
| | | Type of Container | gG | gG | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS None | | No. of Container(s) | 1 | 1 | | | | | |
| | | Volume | 125mL | 250mL | | | | | |
| Special Handling and/or Storage Cool 4C | | Sample Analysis | TPH-Diesel Range - WTPH-D + | PAHs - 6310 | | | | | |
| | | | | | | | | | |
| Sample No. | Matrix | Sample Date | Sample Time | | | | | | |
| J1TL55 | SOIL | 05/01/14 | 0833 | X | X | | | | |
| J1TL56 | SOIL | 05/01/14 | 0835 | X | X | | | | |
| J1TL57 | SOIL | 05/01/14 | 0838 | X | X | | | | |
| J1TL58 | SOIL | 05/01/14 | 0840 | X | X | | | | |
| J1TL59 | SOIL | 05/01/14 | 0830 | X | X | | | | |
| CHAIN OF POSSESSION | | | | Sign/Print Names | | SPECIAL INSTRUCTIONS | | | |
| Relinquished By/Removed From | | Date/Time | Received By/Stored In | | Date/Time | | | | |
| Quincy Stowe | | 5-1-14 | R. F. Filler | | 5-1-14 | | | | |
| Relinquished By/Removed From | | Date/Time | Received By/Stored In | | Date/Time | | | | |
| R. F. Filler | | 5-1-14 | Moshe DUSHEA | | 5/1/14 | | | | |
| Relinquished By/Removed From | | Date/Time | Received By/Stored In | | Date/Time | | | | |
| Moshe DUSHEA | | 5/1/14 1200 | Fed Ex | | 5/2/14 9:40 | | | | |
| Relinquished By/Removed From | | Date/Time | Received By/Stored In | | Date/Time | | | | |
| | | | | | | | | | |
| Relinquished By/Removed From | | Date/Time | Received By/Stored In | | Date/Time | | | | |
| | | | | | | | | | |
| Relinquished By/Removed From | | Date/Time | Received By/Stored In | | Date/Time | | | | |
| | | | | | | | | | |
| FINAL SAMPLE DISPOSITION | | Disposal Method | Disposed By | | Date/Time | | | | |
| | | | | | | | | | |

WCH-EE-011

422R402
5/2/14

JP0785

| Washington Closure Hanford | | | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-189-286 | | Page 2 of 2 | | |
|---|--------|---------------------------------|-------------|--|-----------------------------------|--|--|--|--|---------------------|--|--|
| Collector <i>D. Stowe</i> | | | | Company Contact Joan Kessner | | Telephone No. 375-4688 | | Project Coordinator KESSNER, JH | | Price Code 7 day | | |
| Project Designation 100N Field Remediation | | | | Sampling Location 100-N-99 Verification | | SAF No. RC-189 | | Data Turnaround | | | | |
| Ice Chest No. <i>WCH-11-009</i> | | | | Field Logbook No. EL-1852-11 | | COA 000N992000 | | Method of Shipment Commercial Carrier <i>Fed Ex</i> | | | | |
| Shipped To TestAmerica Denver | | | | Offsite Property No. <i>A131135</i> | | Bill of Lading/Air Bill No. <i>See DSPC</i> | | | | | | |
| Other Labs Shipped To <i>n/a</i> | | | | Preservation | Cool 4C | Cool 4C | | | | | | |
| | | | | Type of Container | 4G | 4G | | | | | | |
| | | | | No. of Container(s) | 1 | 1 | | | | | | |
| | | | | Volume | 125mL | 250mL | | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS <i>None</i> | | | | Sample Analysis | TPH-Diesel Range - WTPH-D + | PAHs - 8310 | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Special Handling and/or Storage <i>Cool 4C</i> | | | | | | | | | | | | |
| Sample No. | Matrix | Sample Date | Sample Time | | | | | | | | | |
| J1TL60 | SOIL | <i>05/01/14</i> | <i>0822</i> | <i>X</i> | <i>X</i> | | | | | | | |
| J1TL61 | SOIL | <i>05/01/14</i> | <i>0826</i> | <i>X</i> | <i>X</i> | | | | | | | |
| J1TL62 | SOIL | <i>05/01/14</i> | <i>0828</i> | <i>X</i> | <i>X</i> | | | | | | | |
| J1TL63 | SOIL | <i>05/01/14</i> | <i>0822</i> | <i>X</i> | <i>X</i> | | | | | | | |
| J1TL64 | SOIL | <i>05/01/14</i> | <i>0820</i> | <i>n/a</i> | <i>X</i> | | | | | | | |
| CHAIN OF POSSESSION | | | | Sign/Print Names | | | | SPECIAL INSTRUCTIONS | | | | |
| Relinquished By/Removed From <i>Quincy Stowe</i> | | Date/Time <i>5-1-14</i> | | Received By/Stored In <i>R. Fahler</i> | | Date/Time <i>5-1-14</i> | | <div style="text-align: center;"> <p>JP0785</p>  </div> | | | | |
| Relinquished By/Removed From <i>R. Fahler</i> | | Date/Time <i>5-1-14</i> | | Received By/Stored In <i>M. W. Shea</i> | | Date/Time <i>5/1/14</i> | | | | | | |
| Relinquished By/Removed From <i>M. W. Shea</i> | | Date/Time <i>5/1/14 1200</i> | | Received By/Stored In <i>Fed Ex</i> | | Date/Time <i>5/2/14 9:40</i> | | | | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | | | | |
| FINAL SAMPLE DISPOSITION | | Disposal Method | | Disposed By | | Date/Time | | | | | | |

WCH-EE-011

Appendix 5
Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

| | | | | | |
|--------------------|----------|-----------|----------------------|---------------|-------------|
| VALIDATION LEVEL: | A | B | <u>C</u> | D | E |
| PROJECT: | 100-N-99 | | DATA PACKAGE: JP0785 | | |
| VALIDATOR: | ELR | LAB: | TAL | DATE: 5/23/14 | |
| | | | SDG: | JP0785 | |
| ANALYSES PERFORMED | | | | | |
| 8015 | 8021 | 8141 | 8151 | 8315 | <u>8310</u> |
| | | WTPH-HCID | WTPH-G | WTPH-D | |
| | | | | | |
| SAMPLES/MATRIX: | | | | | |
| JITL55 | | JITL56 | | JITL57 | |
| JITL59 | | JITL60 | | JITL61 | |
| JITL63 | | | | | |
| | | | | | |
| Soil | | | | | |

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? Yes No N/AContinuing calibrations acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
 Calibration blank results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
 Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: NO FOS

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? Yes No N/A
 Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
 Surrogates traceable? (Levels D, E) Yes No N/A
 Surrogates expired? (Levels D, E) Yes No N/A
 MS/MSD samples analyzed? Yes No N/A
 MS/MSD results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A
 Comments: NO DIFF

GENERAL ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? Yes ☒ No ☐ N/A ☐

Duplicate results acceptable? Yes ☒ No ☐ N/A ☐

MS/MSD standards NIST traceable? (Levels D, E) Yes ☒ No ☐ N/A ☐

MS/MSD standards expired? (Levels D, E) Yes ☒ No ☐ N/A ☐

Field duplicate RPD values acceptable? Yes ☒ No ☐ N/A ☐

Field split RPD values acceptable? Yes ☒ No ☐ N/A ☐

Transcription/calculation errors? (Levels D, E) Yes ☒ No ☐ N/A ☐

Comments: all but G3 - RPD - 1 cell but benzofluorene 5/31
benzo(b)fluorene
benzo(c)pyrene

6. HOLDING TIMES (all levels)

Samples properly preserved? Yes ☒ No ☐ N/A ☐

Sample holding times acceptable? Yes ☒ No ☐ N/A ☐

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST**8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)**

Results reported for all requested analyses? Yes No N/A
Results supported in the raw data? (Levels D, E) Yes No N/A
Samples properly prepared? (Levels D, E) Yes No N/A
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoridil ® (or other aborbant) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Method Blank - Batch: 280-224050

Method: 8310

Preparation: 3550C

Lab Sample ID: MB 280-224050/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/07/2014 1647
Prep Date: 05/02/2014 1755
Leach Date: N/A

Analysis Batch: 280-224587
Prep Batch: 280-224050
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0507016.D
Initial Weight/Volume: 31.9 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

| Analyte | Result | Qual | MDL | RL |
|------------------------|--------|------|-------------------|----|
| Acenaphthene | 9.4 | U | 9.4 | 94 |
| Acenaphthylene | 8.5 | U | 8.5 | 94 |
| Anthracene | 2.9 | U | 2.9 | 19 |
| Benzo[a]anthracene | 3.0 | U | 3.0 | 14 |
| Benzo[a]pyrene | 6.0 | U | 6.0 | 14 |
| Benzo[b]fluoranthene | 3.9 | U | 3.9 | 14 |
| Benzo[g,h,i]perylene | 6.8 | U | 6.8 | 28 |
| Benzo[k]fluoranthene | 3.7 | U | 3.7 | 14 |
| Chrysene | 4.6 | U | 4.6 | 38 |
| Dibenzo(a,h)anthracene | 10 | U | 10 | 28 |
| Fluoranthene | 12 | U | 12 | 38 |
| Fluorene | 5.0 | U | 5.0 | 28 |
| Indeno[1,2,3-cd]pyrene | 11 | U | 11 | 28 |
| Naphthalene | 11 | U | 11 | 94 |
| Phenanthrene | 11 | U | 11 | 38 |
| Pyrene | 11 | U | 11 | 38 |
| Surrogate | % Rec | | Acceptance Limits | |
| Terphenyl-d14 (SUR) | 82 | | 72 - 115 | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Lab Control Sample - Batch: 280-224050

Method: 8310

Preparation: 3550C

Lab Sample ID: LCS 280-224050/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/07/2014 1718
Prep Date: 05/02/2014 1755
Leach Date: N/A

Analysis Batch: 280-224587
Prep Batch: 280-224050
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0507017.D
Initial Weight/Volume: 30.5 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|------------------------|--------------|--------|-------------------|----------|------|
| Acenaphthene | 1970 | 1630 | 83 | 78 - 116 | |
| Acenaphthylene | 1970 | 1570 | 80 | 76 - 115 | |
| Anthracene | 1970 | 1540 | 79 | 74 - 115 | |
| Benzo[a]anthracene | 1970 | 1770 | 90 | 85 - 120 | |
| Benzo[a]pyrene | 1970 | 1710 | 87 | 74 - 121 | |
| Benzo[b]fluoranthene | 1970 | 1680 | 85 | 85 - 115 | |
| Benzo[g,h,i]perylene | 1970 | 1830 | 93 | 85 - 120 | |
| Benzo[k]fluoranthene | 1970 | 1760 | 90 | 85 - 115 | |
| Chrysene | 1970 | 1730 | 88 | 83 - 115 | |
| Dibenzo(a,h)anthracene | 1970 | 1710 | 87 | 83 - 115 | |
| Fluoranthene | 1970 | 1690 | 86 | 83 - 115 | |
| Fluorene | 1970 | 1680 | 85 | 80 - 115 | |
| Indeno[1,2,3-cd]pyrene | 1970 | 1770 | 90 | 85 - 123 | |
| Naphthalene | 1970 | 1690 | 86 | 80 - 121 | |
| Phenanthrene | 1970 | 1660 | 84 | 80 - 115 | |
| Pyrene | 1970 | 1690 | 86 | 75 - 116 | |
| Surrogate | % Rec | | Acceptance Limits | | |
| Terphenyl-d14 (SUR) | 77 | | 72 - 115 | | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Matrix Spike/

Method: 8310

Matrix Spike Duplicate Recovery Report - Batch: 280-224050

Preparation: 3550C

MS Lab Sample ID: 280-54971-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/07/2014 1819
Prep Date: 05/02/2014 1755
Leach Date: N/A

Analysis Batch: 280-224587
Prep Batch: 280-224050
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0507019.D
Initial Weight/Volume: 30.2 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-54971-1
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/07/2014 1849
Prep Date: 05/02/2014 1755
Leach Date: N/A

Analysis Batch: 280-224587
Prep Batch: 280-224050
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0507020.D
Initial Weight/Volume: 30.0 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|------------------------|----------|-----|-----------|-------------------|-----------|---------|----------|
| | MS | MSD | | | | | |
| Acenaphthene | 58 | 83 | 78 - 116 | 37 | 20 | N | * |
| Acenaphthylene | 55 | 80 | 76 - 115 | 38 | 21 | N | * |
| Anthracene | 55 | 79 | 74 - 115 | 37 | 20 | N | * |
| Benzo[a]anthracene | 64 | 91 | 85 - 120 | 35 | 20 | N | * |
| Benzo[a]pyrene | 62 | 84 | 74 - 121 | 30 | 20 | N | * |
| Benzo[b]fluoranthene | 61 | 85 | 85 - 115 | 35 | 20 | N | * |
| Benzo[g,h,i]perylene | 66 | 92 | 85 - 120 | 34 | 20 | N | * |
| Benzo[k]fluoranthene | 64 | 89 | 85 - 115 | 33 | 20 | N | * |
| Chrysene | 62 | 89 | 83 - 115 | 36 | 20 | N | * |
| Dibenzo(a,h)anthracene | 62 | 85 | 83 - 115 | 33 | 20 | N | * |
| Fluoranthene | 61 | 87 | 83 - 115 | 36 | 20 | N | * |
| Fluorene | 60 | 86 | 80 - 115 | 36 | 20 | N | * |
| Indeno[1,2,3-cd]pyrene | 62 | 88 | 85 - 123 | 35 | 20 | N | * |
| Naphthalene | 59 | 86 | 80 - 121 | 39 | 20 | N | * |
| Phenanthrene | 60 | 85 | 80 - 115 | 36 | 20 | N | * |
| Pyrene | 61 | 87 | 75 - 116 | 36 | 20 | N | * |
| Surrogate | MS % Rec | | MSD % Rec | Acceptance Limits | | | |
| Terphenyl-d14 (SUR) | 57 | | 79 | 72 - 115 | | | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-224050

Method: 8310

Preparation: 3550C

MS Lab Sample ID: 280-54971-1 Units: ug/Kg
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 05/07/2014 1819
 Prep Date: 05/02/2014 1755
 Leach Date: N/A

MSD Lab Sample ID: 280-54971-1
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 05/07/2014 1849
 Prep Date: 05/02/2014 1755
 Leach Date: N/A

| Analyte | Sample Result/Qual | | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual | |
|------------------------|-----------------------|---|--------------------|---------------------|-------------------|--------------------|--------|
| Acenaphthene | 10 | U | 2000 | 2010 | 1150 | N | 1670 * |
| Acenaphthylene | 9.0 | U | 2000 | 2010 | 1100 | N | 1620 * |
| Anthracene | 3.0 | U | 2000 | 2010 | 1100 | N | 1600 * |
| Benzo[a]anthracene | 3.2 | U | 2000 | 2010 | 1280 | N | 1830 * |
| Benzo[a]pyrene | 6.4 | U | 2000 | 2010 | 1240 | N | 1680 * |
| Benzo[b]fluoranthene | 4.2 | U | 2000 | 2010 | 1210 | N | 1720 * |
| Benzo[g,h,i]perylene | 7.2 | U | 2000 | 2010 | 1320 | N | 1860 * |
| Benzo[k]fluoranthene | 3.9 | U | 2000 | 2010 | 1280 | N | 1790 * |
| Chrysene | 4.8 | U | 2000 | 2010 | 1250 | N | 1790 * |
| Dibenzo(a,h)anthracene | 11 | U | 2000 | 2010 | 1230 | N | 1720 * |
| Fluoranthene | 13 | U | 2000 | 2010 | 1220 | N | 1750 * |
| Fluorene | 5.3 | U | 2000 | 2010 | 1190 | N | 1720 * |
| Indeno[1,2,3-cd]pyrene | 12 | U | 2000 | 2010 | 1250 | N | 1770 * |
| Naphthalene | 12 | U | 2000 | 2010 | 1180 | N | 1740 * |
| Phenanthrene | 12 | U | 2000 | 2010 | 1190 | N | 1710 * |
| Pyrene | 12 | U | 2000 | 2010 | 1220 | N | 1750 * |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Method Blank - Batch: 280-225338

Method: 8310

Preparation: 3550C

Lab Sample ID: MB 280-225338/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/14/2014 1110
Prep Date: 05/12/2014 1434
Leach Date: N/A

Analysis Batch: 280-225681
Prep Batch: 280-225338
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0514008.D
Initial Weight/Volume: 30.2 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

| Analyte | Result | Qual | MDL | RL |
|------------------------|--------|------|-------------------|----|
| Acenaphthene | 9.9 | U | 9.9 | 99 |
| Acenaphthylene | 8.9 | U | 8.9 | 99 |
| Anthracene | 3.0 | U | 3.0 | 20 |
| Benzo[a]anthracene | 3.2 | U | 3.2 | 15 |
| Benzo[a]pyrene | 6.4 | U | 6.4 | 15 |
| Benzo[b]fluoranthene | 4.2 | U | 4.2 | 15 |
| Benzo[g,h,i]perylene | 7.2 | U | 7.2 | 30 |
| Benzo[k]fluoranthene | 3.9 | U | 3.9 | 15 |
| Chrysene | 4.8 | U | 4.8 | 40 |
| Dibenzo(a,h)anthracene | 11 | U | 11 | 30 |
| Fluoranthene | 13 | U | 13 | 40 |
| Fluorene | 5.2 | U | 5.2 | 30 |
| Indeno[1,2,3-cd]pyrene | 12 | U | 12 | 30 |
| Naphthalene | 12 | U | 12 | 99 |
| Phenanthrene | 12 | U | 12 | 40 |
| Pyrene | 12 | U | 12 | 40 |
| Surrogate | % Rec | | Acceptance Limits | |
| Terphenyl-d14 (SUR) | 78 | | 72 - 115 | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Lab Control Sample - Batch: 280-225338

Method: 8310

Preparation: 3550C

Lab Sample ID: LCS 280-225338/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/14/2014 1140
Prep Date: 05/12/2014 1434
Leach Date: N/A

Analysis Batch: 280-225681
Prep Batch: 280-225338
Leach Batch: N/A
Units: ug/Kg

Instrument ID: CHHPLC_G
Lab File ID: G0514009.D
Initial Weight/Volume: 30.9 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|------------------------|--------------|--------|-------------------|----------|------|
| Acenaphthene | 1940 | 1560 | 80 | 78 - 116 | |
| Acenaphthylene | 1940 | 1490 | 77 | 76 - 115 | |
| Anthracene | 1940 | 1460 | 75 | 74 - 115 | |
| Benzo[a]anthracene | 1940 | 1680 | 87 | 85 - 120 | |
| Benzo[a]pyrene | 1940 | 1610 | 83 | 74 - 121 | |
| Benzo[b]fluoranthene | 1940 | 1600 | 82 | 85 - 115 | N |
| Benzo[g,h,i]perylene | 1940 | 1730 | 89 | 85 - 120 | |
| Benzo[k]fluoranthene | 1940 | 1680 | 86 | 85 - 115 | |
| Chrysene | 1940 | 1650 | 85 | 83 - 115 | |
| Dibenzo(a,h)anthracene | 1940 | 1610 | 83 | 83 - 115 | |
| Fluoranthene | 1940 | 1610 | 83 | 83 - 115 | |
| Fluorene | 1940 | 1590 | 82 | 80 - 115 | |
| Indeno[1,2,3-cd]pyrene | 1940 | 1650 | 85 | 85 - 123 | |
| Naphthalene | 1940 | 1620 | 83 | 80 - 121 | |
| Phenanthrene | 1940 | 1590 | 82 | 80 - 115 | |
| Pyrene | 1940 | 1610 | 83 | 75 - 116 | |
| Surrogate | % Rec | | Acceptance Limits | | |
| Terphenyl-d14 (SUR) | 80 | | 72 - 115 | | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-225338

Method: 8310

Preparation: 3550C

MS Lab Sample ID: 280-54971-9
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/14/2014 1241
Prep Date: 05/12/2014 1434
Leach Date: N/A

Analysis Batch: 280-225681
Prep Batch: 280-225338
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0514011.D
Initial Weight/Volume: 30.9 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

MSD Lab Sample ID: 280-54971-9
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/14/2014 1312
Prep Date: 05/12/2014 1434
Leach Date: N/A

Analysis Batch: 280-225681
Prep Batch: 280-225338
Leach Batch: N/A

Instrument ID: CHHPLC_G
Lab File ID: G0514012.D
Initial Weight/Volume: 30.3 g
Final Weight/Volume: 4 mL
Injection Volume: 20 uL
Column ID: PRIMARY

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|------------------------|----------|-----|-----------|-------------------|-----------|---------|----------|
| | MS | MSD | | | | | |
| Acenaphthene | 78 | 81 | 78 - 116 | 6 | 20 | | |
| Acenaphthylene | 75 | 78 | 76 - 115 | 5 | 21 | N | |
| Anthracene | 72 | 75 | 74 - 115 | 5 | 20 | N | |
| Benzo[a]anthracene | 85 | 87 | 85 - 120 | 4 | 20 | | |
| Benzo[a]pyrene | 77 | 79 | 74 - 121 | 4 | 20 | | |
| Benzo[b]fluoranthene | 80 | 81 | 85 - 115 | 4 | 20 | N | N |
| Benzo[g,h,i]perylene | 86 | 88 | 85 - 120 | 4 | 20 | | |
| Benzo[k]fluoranthene | 83 | 85 | 85 - 115 | 4 | 20 | N | |
| Chrysene | 83 | 85 | 83 - 115 | 4 | 20 | | |
| Dibenzo(a,h)anthracene | 80 | 81 | 83 - 115 | 4 | 20 | N | N |
| Fluoranthene | 81 | 83 | 83 - 115 | 4 | 20 | N | |
| Fluorene | 80 | 83 | 80 - 115 | 6 | 20 | | |
| Indeno[1,2,3-cd]pyrene | 82 | 84 | 85 - 123 | 4 | 20 | N | N |
| Naphthalene | 87 | 90 | 80 - 121 | 6 | 20 | | |
| Phenanthrene | 80 | 82 | 80 - 115 | 5 | 20 | | |
| Pyrene | 81 | 83 | 75 - 116 | 4 | 20 | | |
| Surrogate | MS % Rec | | MSD % Rec | Acceptance Limits | | | |
| Terphenyl-d14 (SUR) | 80 | | 81 | 72 - 115 | | | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-225338

Method: 8310

Preparation: 3550C

MS Lab Sample ID: 280-54971-9 Units: ug/Kg
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 05/14/2014 1241
 Prep Date: 05/12/2014 1434
 Leach Date: N/A

MSD Lab Sample ID: 280-54971-9
 Client Matrix: Solid
 Dilution: 1.0
 Analysis Date: 05/14/2014 1312
 Prep Date: 05/12/2014 1434
 Leach Date: N/A

| Analyte | Sample Result/Qual | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual |
|------------------------|-----------------------|--------------------|---------------------|-------------------|--------------------|
| Acenaphthene | 10 U | 1960 | 2000 | 1540 | 1630 |
| Acenaphthylene | 9.0 U | 1960 | 2000 | 1470 N | 1550 |
| Anthracene | 3.1 U | 1960 | 2000 | 1420 N | 1490 |
| Benzo[a]anthracene | 3.2 U | 1960 | 2000 | 1660 | 1730 |
| Benzo[a]pyrene | 6.4 U | 1960 | 2000 | 1520 | 1580 |
| Benzo[b]fluoranthene | 4.2 U | 1960 | 2000 | 1560 N | 1630 N |
| Benzo[g,h,i]perylene | 7.2 U | 1960 | 2000 | 1690 | 1760 |
| Benzo[k]fluoranthene | 4.0 U | 1960 | 2000 | 1630 N | 1690 |
| Chrysene | 4.9 U | 1960 | 2000 | 1630 | 1700 |
| Dibenzo(a,h)anthracene | 11 U | 1960 | 2000 | 1560 N | 1630 N |
| Fluoranthene | 13 U | 1960 | 2000 | 1590 N | 1660 |
| Fluorene | 5.3 U | 1960 | 2000 | 1560 | 1650 |
| Indeno[1,2,3-cd]pyrene | 12 U | 1960 | 2000 | 1610 N | 1670 N |
| Naphthalene | 12 U | 1960 | 2000 | 1700 | 1800 |
| Phenanthrene | 12 U | 1960 | 2000 | 1570 | 1640 |
| Pyrene | 12 U | 1960 | 2000 | 1590 | 1660 |

Date: 27 May 2014
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100N Field Remediation – Soil Full Protocol - Waste Site 100-N-99
Subject: Diesel Range Organic - Data Package No. JP0785-TAL

INTRODUCTION

This memo presents the results of data validation on Data Package No. JP0785 prepared by TestAmerica Laboratories (TAL). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

| Sample ID | Sample Date | Media | Validation | Analyte |
|-----------|-------------|-------|------------|------------|
| J1TL55 | 5/1/14 | Soil | C | See note 1 |
| J1TL56 | 5/1/14 | Soil | C | See note 1 |
| J1TL57 | 5/1/14 | Soil | C | See note 1 |
| J1TL58 | 5/1/14 | Soil | C | See note 1 |
| J1TL59 | 5/1/14 | Soil | C | See note 1 |
| J1TL60 | 5/1/14 | Soil | C | See note 1 |
| J1TL61 | 5/1/14 | Soil | C | See note 1 |
| J1TL62 | 5/1/14 | Soil | C | See note 1 |
| J1TL63 | 5/1/14 | Soil | C | See note 1 |

1 – Diesel range organics by NWTPH-Dx.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites (DOE/RL-2005-92, Rev. 0, October 2006). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1TL60/J1TL63) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. JP0785 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-2005-92, Rev. 0, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites*, U.S. Department of Energy, October 2006.

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DIESEL RANGE ORGANIC DATA QUALIFICATION SUMMARY*

| | | | |
|---|--------------------------|------------------------------|----------------------------------|
| SDG: JP0785 | REVIEWER: ELR | Project: 100-N-99 | PAGE <u>1</u> OF <u>1</u> |
| COMMENTS: No qualifiers assigned | | | |

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3
Annotated Laboratory Reports

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL55

Lab Sample ID: 280-54971-1

Date Sampled: 05/01/2014 0833

Client Matrix: Solid

% Moisture: 0.7

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060007.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.0 g |
| Analysis Date: | 05/06/2014 1239 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|-----|------|
| C10-C36 | | 2000 | J | 970 | 3900 |
| C10-C28 | | 1100 | J | 660 | 3900 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 76 | | 49 - 115 |

✓
5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL56

Lab Sample ID: 280-54971-2

Date Sampled: 05/01/2014 0835

Client Matrix: Solid

% Moisture: 1.6

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060008.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 05/06/2014 1308 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|------|------|
| C10-C36 | | 22000 | | 1000 | 4100 |
| C10-C28 | | 12000 | | 690 | 4100 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 79 | | 49 - 115 |

✓
5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL57

Lab Sample ID: 280-54971-3

Date Sampled: 05/01/2014 0838

Client Matrix: Solid

% Moisture: 3.2

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060009.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 31.5 g |
| Analysis Date: | 05/06/2014 1337 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|-----|------|
| C10-C36 | | 3600 | J | 980 | 3900 |
| C10-C28 | | 1800 | J | 670 | 3900 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 75 | | 49 - 115 |

✓
5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL58

Lab Sample ID: 280-54971-4

Date Sampled: 05/01/2014 0840

Client Matrix: Solid

% Moisture: 1.2

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060010.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.3 g |
| Analysis Date: | 05/06/2014 1406 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|------|------|
| C10-C36 | | 2100 | J | 1000 | 4000 |
| C10-C28 | | 1300 | J | 680 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 75 | | 49 - 115 |

✓
5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL59

Lab Sample ID: 280-54971-5

Date Sampled: 05/01/2014 0830

Client Matrix: Solid

% Moisture: 1.0

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060011.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.8 g |
| Analysis Date: | 05/06/2014 1436 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|-----|------|
| C10-C36 | | 1900 | J | 980 | 3900 |
| C10-C28 | | 1200 | J | 670 | 3900 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 77 | | 49 - 115 |

✓
5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL60

Lab Sample ID: 280-54971-6

Date Sampled: 05/01/2014 0822

Client Matrix: Solid

% Moisture: 1.0

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060014.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.6 g |
| Analysis Date: | 05/06/2014 1602 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|-----|------|
| C10-C36 | | 2200 | J | 990 | 4000 |
| C10-C28 | | 1300 | J | 670 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 73 | | 49 - 115 |

✓
5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL61

Lab Sample ID: 280-54971-7

Date Sampled: 05/01/2014 0826

Client Matrix: Solid

% Moisture: 1.0

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060015.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 32.0 g |
| Analysis Date: | 05/06/2014 1631 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|-----|------|
| C10-C36 | | 1500 | J | 940 | 3800 |
| C10-C28 | | 950 | J | 640 | 3800 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 72 | | 49 - 115 |

✓ 5/24/14

Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL62

Lab Sample ID: 280-54971-8

Date Sampled: 05/01/2014 0828

Client Matrix: Solid

% Moisture: 1.1

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060016.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.5 g |
| Analysis Date: | 05/06/2014 1700 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|-----|------|
| C10-C36 | | 1800 | J | 990 | 4000 |
| C10-C28 | | 1100 | J | 670 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 78 | | 49 - 115 |



Analytical Data

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Client Sample ID: J1TL63

Lab Sample ID: 280-54971-9

Date Sampled: 05/01/2014 0822

Client Matrix: Solid

% Moisture: 0.9

Date Received: 05/02/2014 0940

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

| | | | | | |
|------------------|-----------------|-----------------|------------|------------------------|------------|
| Analysis Method: | NWTPH-Dx | Analysis Batch: | 280-224395 | Instrument ID: | SGC_U |
| Prep Method: | 3550C | Prep Batch: | 280-224063 | Lab File ID: | 05060017.D |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 30.1 g |
| Analysis Date: | 05/06/2014 1729 | | | Final Weight/Volume: | 1 mL |
| Prep Date: | 05/02/2014 1917 | | | Injection Volume: | 1 uL |

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---------|--------------------|----------------|-----------|------|------|
| C10-C36 | | 1600 | J | 1000 | 4000 |
| C10-C28 | | 1000 | J | 680 | 4000 |

| Surrogate | %Rec | Qualifier | Acceptance Limits |
|-------------|------|-----------|-------------------|
| o-Terphenyl | 78 | | 49 - 115 |

✓ 5/24/14

Appendix 4
Laboratory Narrative and Chain-of-Custody Documentation

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-54971-1

SDG #: JP0785

SAF#: RC-189

Date SDG Closed: May 2, 2014

Data Deliverable: 7 Day / Summary

| <u>CLIENT ID</u> | <u>LAB ID</u> | <u>ANALYSES REQUESTED</u> | <u>ANALYSES PERFORMED</u> |
|------------------|---------------|---------------------------|---------------------------|
| J1TL55 | 280-54971-1 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL56 | 280-54971-2 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL57 | 280-54971-3 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL58 | 280-54971-4 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL59 | 280-54971-5 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL60 | 280-54971-6 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL61 | 280-54971-7 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL62 | 280-54971-8 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL63 | 280-54971-9 | WTPH-D+/8310 | NWTPH-Dx/8310 |
| J1TL64 | 280-54971-10 | 8310 | 8310 |

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 5/2/2014 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.4° C.

GC SEMIVOLATILES - NWTPH-Dx - DRO

No anomalies were encountered.


HPLC - SW846 8310 - PAHs

The LCS, MS and MSD associated with sample J1TL63 in batch 280-225338 exhibited percent recoveries outside the control limits, biased low, for Benzo(b)fluoranthene. It can be noted that this was the third extraction/analysis of sample J1TL63. Two previous extractions/analyses performed on sample J1TL63 showed no detectable concentrations, but exhibited surrogate recovery or multiple LCS outliers. As the sample has been confirmed to be Non-Detect, a fourth extraction/analysis was not initiated. The client was notified on 5/15/2014.

The MS aliquot of the MS/MSD performed on sample J1TL55 in batch 280-224050 exhibited all spike compound recoveries and the surrogate recovery outside the control limits, biased low. The associated sample results have been flagged "N". As a result of the low MS recoveries, the MS/MSD RPD limits were exceeded. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

The MS/MSD performed on sample J1TL63 in batch 280-225338 exhibited spike compound recoveries outside the control limits, and the associated sample results have been flagged "N". The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary.

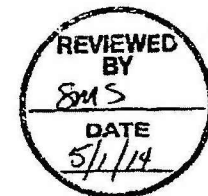
No other anomalies were encountered.

| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-189-286 | | Page 1 of 2 | | | |
|---|--|--|-------------|-----------------------------------|-------------|--|--|------------------------------------|--|-------------|--|
| Collector Q. STOWE | | Company Contact Joan Kessner | | Telephone No. 375-4688 | | Project Coordinator KESSNER, JH | | Price Code 7 day | | | |
| Project Designation 100N Field Remediation | | Sampling Location 100-N-99 Verification | | SAF No. RC-189 | | Method of Shipment Commercial Carrier | | Data Turnaround 1 Fed Ex | | | |
| Ice Chest No. WCH-11-009 | | Field Logbook No. EL-1652-11 | | COA 000N992000 | | Bill of Lading/Air Bill No. See O.S.P.C. | | | | | |
| Shipped To TestAmerica Denver | | Offsite Property No. A131135 | | | | | | | | | |
| Other Labs Shipped To NIA | | Preservation | | Cool 4C | Cool 4C | | | | | | |
| | | Type of Container | | gG | gG | | | | | | |
| | | No. of Container(s) | | 1 | 1 | | | | | | |
| | | Volume | | 125mL | 250mL | | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS None | | Sample Analysis | | TPH-Diesel Range - WTPH-D + | PAHs - 6310 | | | | | | |
| | | | | | | | | | | | |
| Special Handling and/or Storage Cool 4C | | | | | | | | | | | |
| Sample No. | | Matrix | Sample Date | Sample Time | | | | | | | |
| J1TL55 | | SOIL | 05/01/14 | 0833 | X | X | | | | | |
| J1TL56 | | SOIL | 05/01/14 | 0835 | X | X | | | | | |
| J1TL57 | | SOIL | 05/01/14 | 0838 | X | X | | | | | |
| J1TL58 | | SOIL | 05/01/14 | 0840 | X | X | | | | | |
| J1TL59 | | SOIL | 05/01/14 | 0830 | X | X | | | | | |
| CHAIN OF POSSESSION | | | | Sign/Print Names | | <div style="text-align: left;">SPECIAL INSTRUCTIONS</div> <div style="text-align: center; font-size: 2em; margin-top: 20px;">JP0785</div> <div style="text-align: center; margin-top: 20px;">  </div> | | | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | | | | | Date/Time | |
| Quincy Stowe | | 5-1-14 0845 | | R. Fehlbauer | | | | | | 5-1-14 1005 | |
| R. Fehlbauer | | 5-1-14 1005 | | MOSHE DWISHEA | | | | | | 5/1/14 1200 | |
| MOSHE DWISHEA | | 5/1/14 1200 | | Fed Ex | | | | | | 5/2/14 9:40 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| FINAL SAMPLE DISPOSITION | | Disposal Method | | Disposed By | | Date/Time | | | | | |

WCH-EE-011

42IR402
2-5-14

| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | RC-189-286 | | Page 2 of 2 | |
|---|--------|--|-------------|---|-------------|--|--|---------------------------|--|
| Collector <i>Q Stone</i> | | Company Contact Joan Kessner | | Telephone No. 375-4688 | | Project Coordinator KESSNER, JH | | Price Code 7 day | |
| Project Designation 100N Field Remediation | | Sampling Location 100-N-99 Verification | | SAF No. RC-189 | | Method of Shipment Commercial Carrier | | Data Turnaround Fed Ex | |
| Ice Chest No. WCH-11-009 | | Field Logbook No. EL-1652-11 | | COA 000N992000 | | Method of Shipment Commercial Carrier | | Data Turnaround Fed Ex | |
| Shipped To TestAmerica Denver | | Offsite Property No. A131135 | | COA 000N992000 | | Method of Shipment Commercial Carrier | | Data Turnaround Fed Ex | |
| Other Labs Shipped To n/a | | Preservation | | Cool 4C | Cool 4C | | | | |
| | | Type of Container | | gG | gG | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS None | | No. of Container(s) | | 1 | 1 | | | | |
| | | Volume | | 125mL | 250mL | | | | |
| Special Handling and/or Storage Cool 4C | | Sample Analysis | | TPH-Diesel Range - WTPH-C + | PAHs - 8310 | | | | |
| Sample No. | Matrix | Sample Date | Sample Time | | | | | | |
| J1TL60 | SOIL | 05/01/14 | 0822 | X | X | | | | |
| J1TL61 | SOIL | 05/01/14 | 0826 | X | X | | | | |
| J1TL62 | SOIL | 05/01/14 | 0828 | X | X | | | | |
| J1TL63 | SOIL | 05/01/14 | 0822 | X | X | | | | |
| J1TL64 | SOIL | 05/01/14 | 0820 | n/a | X | | | | |
| CHAIN OF POSSESSION | | | | Sign/Print Names | | SPECIAL INSTRUCTIONS | | | |
| Relinquished By/Removed From <i>Quincy Stone</i> | | Date/Time 0845 5-1-14 | | Received By/Stored In <i>R. Fahlberg</i> | | Date/Time 0845 5-1-14 | | | |
| Relinquished By/Removed From <i>R. Fahlberg</i> | | Date/Time 1005 5-1-14 | | Received By/Stored In <i>Mosher</i> | | Date/Time 1005 5-1-14 | | | |
| Relinquished By/Removed From <i>Mosher</i> | | Date/Time 1200 5/1/14 | | Received By/Stored In <i>Fed Ex</i> | | Date/Time 5/2/14 9:40 | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | |
| Relinquished By/Removed From | | Date/Time | | Received By/Stored In | | Date/Time | | | |
| FINAL SAMPLE DISPOSITION | | Disposal Method | | Disposed By | | Date/Time | | | |
| WCH-EE-011 | | | | | | | | | |



JP0785

Appendix 5
Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

| | | | | | |
|--------------------|----------|-----------|----------------------|---------------|---|
| VALIDATION LEVEL: | A | B | C | D | E |
| PROJECT: | 100-N-99 | | DATA PACKAGE: JP0785 | | |
| VALIDATOR: | FELR | LAB: | TAL | DATE: 5/23/14 | |
| | | | SDG: | JP0785 | |
| ANALYSES PERFORMED | | | | | |
| 8015 | 8021 | 8141 | 8151 | 8315 | |
| | | WTPH-HCID | WTPH-G | WTPH-D | |
| | | | | | |
| SAMPLES/MATRIX: | | | | | |
| JITL55 | | JITL56 | | JITL57 | |
| JITL59 | | JITL60 | | JITL61 | |
| JITL63 | | | | | |
| | | | | | |
| Soil | | | | | |

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

Initial calibrations acceptable? Yes No **N/A**Continuing calibrations acceptable? Yes No **N/A**Standards traceable? Yes No **N/A**Standards expired? Yes No **N/A**Calculation check acceptable? Yes No **N/A**

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
 Calibration blank results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
 Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: no FR

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? Yes No N/A
 Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
 Surrogates traceable? (Levels D, E) Yes No N/A
 Surrogates expired? (Levels D, E) Yes No N/A
 MS/MSD samples analyzed? Yes No N/A
 MS/MSD results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A
 Comments: no PAS

GENERAL ORGANIC DATA VALIDATION CHECKLIST**5. PRECISION (Levels C, D, and E)**

Duplicate RPD values acceptable? ☒ Yes No N/A

Duplicate results acceptable? ☒ Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) Yes No ☒ N/A

MS/MSD standards expired? (Levels D, E) Yes No ☒ N/A

Field duplicate RPD values acceptable? ☒ Yes No N/A

Field split RPD values acceptable? Yes No ☒ N/A

Transcription/calculation errors? (Levels D, E) Yes No ☒ N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ☒ Yes No N/A

Sample holding times acceptable? ☒ Yes No N/A

Comments: _____

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? Yes No N/A
Results supported in the raw data? (Levels D, E) Yes No N/A
Samples properly prepared? (Levels D, E) Yes No N/A
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoriscil ® (or other absorbant) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

Appendix 6
Additional Documentation Requested by Client

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Method Blank - Batch: 280-224063

Method: NWTPH-Dx
Preparation: 3550C

Lab Sample ID: MB 280-224063/1-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/06/2014 1145
Prep Date: 05/02/2014 1917
Leach Date: N/A

Analysis Batch: 280-224395
Prep Batch: 280-224063
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_U
Lab File ID: 05060005.D
Initial Weight/Volume: 30.5 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

| Analyte | Result | Qual | MDL | RL |
|-------------|--------|-------------------|-----|------|
| C10-C36 | 980 | U | 980 | 3900 |
| C10-C28 | 670 | U | 670 | 3900 |
| Surrogate | % Rec | Acceptance Limits | | |
| o-Terphenyl | 74 | 49 - 115 | | |

Lab Control Sample - Batch: 280-224063

Method: NWTPH-Dx
Preparation: 3550C

Lab Sample ID: LCS 280-224063/2-A
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/06/2014 1214
Prep Date: 05/02/2014 1917
Leach Date: N/A

Analysis Batch: 280-224395
Prep Batch: 280-224063
Leach Batch: N/A
Units: ug/Kg

Instrument ID: SGC_U
Lab File ID: 05060006.D
Initial Weight/Volume: 32.2 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|-------------|--------------|-------------------|--------|----------|------|
| C10-C36 | 62200 | 53900 | 87 | 57 - 115 | |
| C10-C28 | 62200 | 53900 | 87 | 53 - 115 | |
| Surrogate | % Rec | Acceptance Limits | | | |
| o-Terphenyl | 71 | 49 - 115 | | | |

Quality Control Results

Client: Washington Closure Hanford

Job Number: 280-54971-1

Sdg Number: JP0785

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-224063

Method: NWTPH-Dx

Preparation: 3550C

MS Lab Sample ID: 280-54971-5
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/06/2014 1504
Prep Date: 05/02/2014 1917
Leach Date: N/A

Analysis Batch: 280-224395
Prep Batch: 280-224063
Leach Batch: N/A

Instrument ID: SGC_U
Lab File ID: 05060012.D
Initial Weight/Volume: 32.2 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

MSD Lab Sample ID: 280-54971-5
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/06/2014 1533
Prep Date: 05/02/2014 1917
Leach Date: N/A

Analysis Batch: 280-224395
Prep Batch: 280-224063
Leach Batch: N/A

Instrument ID: SGC_U
Lab File ID: 05060013.D
Initial Weight/Volume: 30.0 g
Final Weight/Volume: 1 mL
Injection Volume: 1 uL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|-------------|----------|-----|-----------|-------------------|-----------|---------|----------|
| | MS | MSD | | | | | |
| C10-C36 | 78 | 86 | 57 - 115 | 15 | 23 | | |
| C10-C28 | 79 | 86 | 56 - 115 | 16 | 23 | | |
| Surrogate | MS % Rec | | MSD % Rec | Acceptance Limits | | | |
| o-Terphenyl | 72 | | 67 | 49 - 115 | | | |

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 280-224063

Method: NWTPH-Dx

Preparation: 3550C

MS Lab Sample ID: 280-54971-5
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/06/2014 1504
Prep Date: 05/02/2014 1917
Leach Date: N/A

Units: ug/Kg

MSD Lab Sample ID: 280-54971-5
Client Matrix: Solid
Dilution: 1.0
Analysis Date: 05/06/2014 1533
Prep Date: 05/02/2014 1917
Leach Date: N/A

| Analyte | Sample Result/Qual | MS Spike Amount | MSD Spike Amount | MS Result/Qual | MSD Result/Qual |
|---------|--------------------|-----------------|------------------|----------------|-----------------|
| C10-C36 | 1900 J | 62800 | 67400 | 51100 | 59700 |
| C10-C28 | 1200 J | 62800 | 67400 | 50700 | 59400 |